CLAIMS

1. A method for providing a vertical comb drive, the method comprising: fabricating a device comprising rotor comb element, the rotor element comb comprising a main body and a plurality of substantially parallel extensions in a comb arrangement, and at least one of a plurality of stator comb elements, comprising a main body and a plurality of substantially parallel extensions in a comb arrangement, adapted to be interlaced with the rotor, all on a single layer of a substrate.

2. The method of claim 1, wherein said at least one of a plurality of stators comprise two, substantially opposite stators, wherein the rotor is located between the two stators.

3. The method of claim 1, wherein fabricating of the device is done in a micro-machining process.

4. The method of claim 1, wherein said at least one of a plurality of stators are positioned and secured in position using glue.

5. The method of claim 1, wherein displacement limiters are used to limit displacement of the rotor.

6. The method of claim 5, wherein the displacement limiters compriseedges of slits in a surrounding body.

7. The method of claim 1, wherein the rotor and said at least one of a plurality of stators are each suspended on flexible supports.

8. The method of claim 7, wherein the flexible supports are used to reposition the rotor with respect to said at least one of a plurality of stators, so as to achieve realignment.

9. The method of claim 7, wherein the flexible supports have nonlinear kinematic-dependent rigidity.

10. The method of claim 1, wherein the rotor is provided with two substantially opposite torsion bars that define a rotation axis substantually near an external surface of the rotor.

11. The method of claim 10, wherein the external surface is an upper surface.

12. The method of claim 11, wherein the external surface is a bottom surface.

13. The method of claim 1, wherein the thickness of the extensions of said at least one of a plurality of stators is greater than the thickness of extensions of the rotor.

14. The method of claim 1, wherein the rotor is positioned in an elevated position with respect to said at least one of a plurality of stators.

15. The method of claim 1, wherein the rotor is positioned in a lowered position with respect to said at least one of a plurality of stators.

16. The method of claim 1, further comprising controlling motion of the rotor by selecting frequencies of rotor motion thereby determining a first time interval of confined motion characterized as the time during which the motion of the rotor is limited by motion limiters and direction of motion is reveresed, and a second time interval during which the motion of the rotor is not limited, and tuning the frequencies to a desired ratio between thes first time interval and the second time interval.

17. The method of claim 1, wherein a driving alternating voltage is used to achieve periodic switching frequency of the rotor.

18. The method of claim 1, wherein the rotor comprises a micro-mirror.

19. A vertical comb drive device comprising:

a rotor comb element, the rotor element comb comprising a main body and a plurality of substantially parallel extensions in a comb arrangement, and at least one of a plurality of stator comb elements, comprising a main body and a plurality of substantially parallel extensions in a comb arrangement, adapted to be interlaced with the rotor, all on a single layer of a substrate.

20. The device of claim 19, wherein said at least one of a plurality of stators comprise two, substantially opposite stators, wherein the rotor is located between the two stators.

21. The device of claim 19, wherein said at least one of a plurality of stators are positioned and secured in position using glue.

22. The device of claim 19, wherein displacement limiters are used to limit displacement of the rotor.

23. The device of claim 22, wherein the displacement limiters comprise edges of slits in a surrounding body.

24. The device of claim 19, wherein the rotor and said at least one of a plurality of stators are each suspended on flexible supports.

25. The device of claim 24, wherein the flexible supports are used to reposition the rotor with respect to said at least one of a plurality of stators, so as to achieve realignment.

26. The device of claim 24, wherein the flexible supports have nonlinear kinematic-dependent rigidity.

27. The devcie of claim 19, wherein the rotor is provided with two substantially opposite torsion bars that define a rotation axis substantually near an external surface of the rotor.

28. The device of claim 27, wherein the external surface is an upper surface.

29. The device of claim 27, wherein the external surface is a bottom surface.

30. The device of claim 19, wherein the thickness of the extensions of said at least one of a plurality of stators is greater than the thickness of extensions of the rotor.

31. The device of claim 19, wherein the rotor is positioned in an elevated position with respect to said at least one of a plurality of stators.

32. The device of claim 19, wherein the rotor is positioned in a lowered position with respect to said at least one of a plurality of stators.

33. The device of claim 19, wherein a driving alternating voltage is used to achieve periodic switching frequency of the rotor.

34. The device of claim 19, wherein the rotor comprises a micro-mirror.

35. A method for providing a vertical comb drive substantially as described in the present specification, accompanying drawings and appending claims.

36. A vertical comb drive device substantially as described in the present specification, accompanying drawings and appending claims.